

TWO NEW SPECIES OF THE GENUS ISCHNOCEROS GRAVENHORST (HYMENOPTERA, ICHNEUMONIDAE) PARASITIZING WOODBORERS WITH A KEY TO SPECIES OF ISCHNOCEROS KNOWN IN CHINA

SHENG Maoling

General Station of Forest Pest Management, State Forestry Administration, Shenyang 110034, China

Abstract Two new ichneumonid species reared from cerambycids are described: *Ischnoceros eutraphae* sp. nov. from *Eutrapha sedecimpunctata* (Motschulsky), wood borer of the tree *Tilia amurensis* Rupr. and *Ischnoceros larianus* sp. nov. from *Monochamus saltuarius* Gebler (Cerambycidae), wood borer of the tree *Larix gmelini* (Rupr.) Rupr. A key to the species of *Ischnoceros* known in China is provided.

Key words Hymenoptera, Ichneumonidae, *Ischnoceros*, new species, woodborer, *Eutrapha sedecimpunctata*, *Monochamus saltuarius*.

1 Introduction

In recent years the author has investigated the parasitoids of wood borers in China extensively. Some results were reported (Sheng, 2005, 2008; Sheng & Li, 2006; Sheng *et al.*, 2004; Sun & Sheng, 2006; Sheng & Sun, 2007). In this paper two new species belonging to the genus *Ischnoceros* Gravenhorst, reared from *Eutrapha sedecimpunctata* (Motschulsky) and *Monochamus saltuarius* Gebler (Cerambycidae), are reported.

Ischnoceros Gravenhorst, 1829 belonging to subfamily Xoridinae (Ichneumonidae), is a small genus with eleven described species (Sheng, 2005; Yu, 2005). They distribute in Oriental, Neotropical, and Holarctic regions (Townes, 1970; Yu & Horstmann, 1997). The Oriental species were reported by Chandra (1978). The Japanese species were studied by Kusigemati (1984). The Russia species were keyed by Kasparyan (1981). One Nearctic species was represented (Townes, 1960). Four species have previously been recorded from China (Sheng, 2005). Biology is little known up to now. Hosts are woodborers, mostly cerambycids (Coleoptera, Cerambycidae). Only one host record, *Buprestis haemorrhoidalis araratica* Marseul, belongs to Buprestidae (Coleoptera) (Campadelli & Scaramozzino, 1994).

2 Materials and Methods

Materials were collected using the following methods.

Rearing parasitoid larvae and pupae. Parasitoid larvae and cocoons were collected from galleries of wood-borer infested logs, and stored individually in glass tubes with a piece of filter paper dipped in distilled water for keeping moisture and plugged tightly with absorbent cotton wool.

Loaned material. Additional material was borrowed from the Zoologische Staatssammlung München,

Germany; the Department of Forest Protection, Forest Research Institute, Warsaw, Poland and the Osaka Museum of Natural History, Osaka, Japan.

Morphological terminology mostly follows that of Gauld (1997) and terms for surface sculpturing follow Harris (1979). Images were taken using a Cool SNAP 3CCD attached to a Zeiss Discovery V8 stereomicroscope. Images were captured with software, QCapture Pro version 5.1. Each measurement was taken three times and the mean reported as the final measurement. A range is reported to represent intraspecific variation among all types.

All specimens of Ichneumonidae and hosts are deposited in Insect Museum, General Station of Forest Pest Management, State Forestry Administration, People's Republic of China.

Genus *Ischnoceros* Gravenhorst, 1829

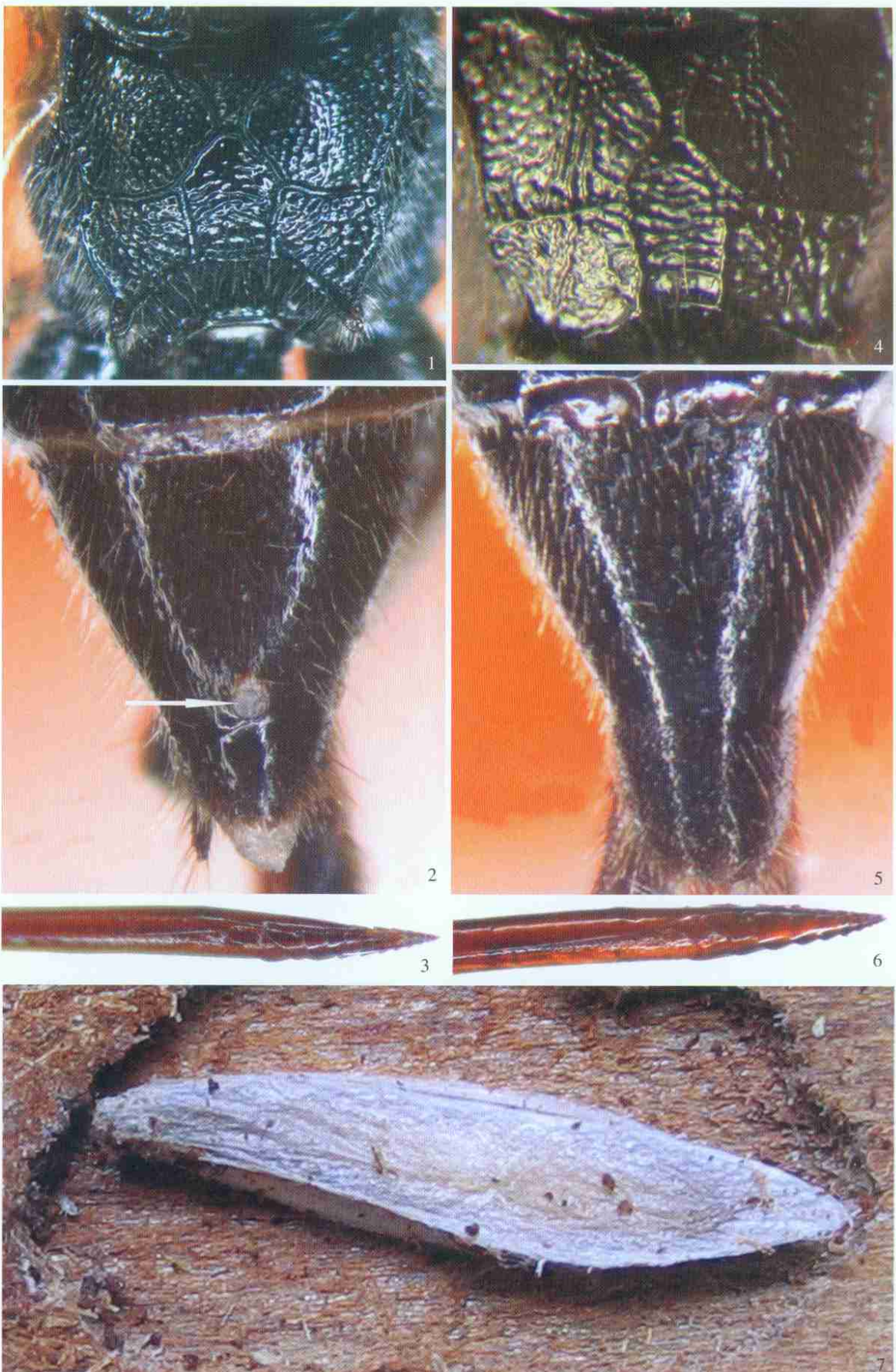
Ischnoceros Gravenhorst, 1829. *Ichneumonologia Europaea*, 2: 949. Type species: *Ichneumon rusticus* Fourcroy.

Diagnosis. Mandible with two teeth, frons with strong median horn or tubercle, and hind femur without median ventral tooth.

Ischnoceros eutraphae sp. nov. (Figs. 1-3)

♀. Body length approximately 11.0–12.0 mm. Forewing length 8.5–9.5 mm. Ovipositor sheath length 4.0–4.5 mm.

Head Face 1.6 × to 1.7 × as wide as long, strongly convex mesally, with distinct punctures, diameter of puncture 1.0 × to 2.0 × distance between punctures, lower-lateral portion with weak oblique groove toward lower central margin of face. Subbase of clypeus transversely convex, anteriorly rugose. Upper tooth distinctly longer than lower tooth. Gena weakly concave. Malar space 0.4 × to 0.5 × as long as basal width of mandible. Temple with fine punctures, diameter



Figs. 1-3. *Ischnoceros eutraphae* sp. nov. Figs. 4-6. *Ischnoceros lanicinus* sp. nov. 1, 4. Propodeum. 2, 5. Tergum 8. 3, 6. Apex of ovipositor. 7. Cocoon.

of puncture $0.3 \times$ to $1.2 \times$ distance between punctures. Vertex smooth with fine and irregular punctures. Postocellar line about as long as ocular-ocellar line. Frons with weakly defined punctures and strong protuberance mesally. Protuberance deeply hollowed and bifurcated at upper portion. Antenna with 33–35 flagellomeres, first flagellomere $1.1 \times$ longer than second, second as long as third. Occipital carina complete or narrowly absent dorsally.

Mesosoma. Pronotum smooth and shining anteriorly, lateral concave with dense transverse rugae, and posterior portion with dense oblique rugae paralleling upper margin of pronotum. Epomia distinct. Mesoscutum with fine and dense punctures, diameter of puncture $1.0 \times$ to $2.0 \times$ distance between punctures; posterior centre rugose. Notaulus deep, nearly reaching centre of mesoscutum. Scutoscuteellar groove longitudinally rugose. Scutellum weakly convex, with punctures, diameter of puncture $1.0 \times$ to $2.0 \times$ distance between punctures. Postscutellum transversely convex, with distinct punctures, diameter of puncture approximately as long as distance between punctures. Mesopleuron with dense punctures, diameter of puncture $1.0 \times$ to $3.0 \times$ distance between punctures. Speculum distinct. Upper end of epicnemial carina reaching front margin of mesopleuron. Epicnemia with unclear punctures. Mesosternum with fine punctures, diameter of puncture $1.0 \times$ to $2.0 \times$ distance between punctures. Metapleuron coarsely sculptured, irregularly rugose. Wings brownish hyaline. Forewing vein 1cu a slightly basal $1/M$; 3rs m absent; 2rs m very short, $0.2 \times$ to $0.3 \times$ as long as distance between it and 2m cu. Hind wing veins $1/Cu$ approximately $2 \times$ length of cu a. Middle tibia slightly twisted, subbasal portion with a oblique longitudinal groove. Carinae of propodeum strong (Fig. 1), areolated completely, with dense punctures. Areola transversely rugose. Petiolar area with longitudinal rugae. Lateral areas with oblique rugae. Pleural areas with irregular oblique rugae. Basal area divergent forward strongly. Propodeal apophysis compressed, $1.5 \times$ to $1.6 \times$ diameter of second antennal flagellomere.

Metasoma. First tergum of metasoma $1.4 \times$ to $1.5 \times$ longer than its apical width, with dense punctures, diameter of puncture $1.1 \times$ to $3.0 \times$ distance between punctures; median dorsal carinae distinct, reaching to front margin of postpetiole; spiracle slightly convex. Second and third terga finely aciculate mesally, anterior and posterior portions with punctures. Fourth to seventh terga finely aciculate. Seventh and eighth terga comparatively elongate; the latter with very weak and unclear punctures, its dorsal centre of hind $1/3$ with small unsclerotized round (Fig. 2). Ovipositor sheath $1.3 \times$ to $1.4 \times$ longer than hind tibia. Apical portion of lower valve of ovipositor (Fig. 3) with 8 ridges, basal 5 ridges

oblique, other 3 ridges vertical.

Coloration. Black. Flagellomeres of antennae blackish brown. Median portion of mandible more or less red. Palpi, tegulae, front and middle legs, most of middle coxae and trochanters brown to reddish brown. Dorsal profiles of hind coxae and trochanters unclearly blackish brown. Basal $1/3$ of hind tibia white. Tegulae reddish brown. Stigma and veins brownish black.

♂. As in female except: body length about 9.5 mm. Forewing length 6.5–6.8 mm. Antenna with 31 flagellomeres. Palpi, front and middle coxae and trochanters yellowish white. Basal $3/5$ of hind tibia and basal $2/5$ of first tarsomere white.

Holotype ♀, Xinbin, Liaoning Province (41.1°N , 125.1°E ; alt. 546 m), 20 Aug. 2005, SHENG Mao-Ling leg. **Paratypes:** 1 ♀, same data as holotype except “9 June 2005”; 1 ♂, same data as holotype except “Yitong, Jilin Province (43.2°N , 125.3°E ; alt. 336 m), 17 May 2005”.

Hosts. Reared from *Eutetrappa sedecimpunctata* (Motschulsky) (Cerambycidae) in *Tilia amurensis* Rupr. (Tiliaceae) in Yitong, Jilin Province.

Host plant. *Tilia amurensis* Rupr. (Tiliaceae)

Etymology. The species name is based on its host's name.

Diagnosis. The new species is similar morphologically to *I. sapporensis* Uchida, 1928, but the two species can be distinguished using the following characters. *I. autrappae* has basal area of propodeum separated from areola by strong carina, propodeal apophysis $1.5 \times$ to $1.6 \times$ diameter of second antennal flagellomere; second tergum finely aciculate; tegula brown; middle coxa mainly brown to reddish brown; and middle femur red. *I. sapporensis* has basal area of propodeum confluent with areola, propodeal apophysis about as long as diameter of second antennal flagellomere; second tergum with punctures; tegula brownish black; middle coxa and femur black.

Distribution. China (Jilin and Liaoning).

Ischnoceros laricinus **sp. nov.** (Figs. 4–7)

♀. Body length 9.0–11.0 mm. Forewing length 7.5–9.0 mm. Ovipositor sheath length 4.0–4.8 mm.

Head. Face approximately $1.8 \times$ as wide as long, strongly convex mesally, with dense punctures, diameter of puncture $2.0 \times$ to $4.0 \times$ distance between punctures, lateral margins with faint punctures, on median dorsal margin with a deep V-shaped notch. Clypeus smooth, finely stigate; transversely convex mesally and concave apically; apical margin weakly convex forward. Mandible with two teeth, upper tooth distinctly longer than lower tooth. Gena slightly coarse. Malar space approximately $0.6 \times$ as long as basal width of mandible. Temple smooth, with fine punctures, diameter of puncture 0.2 to $0.6 \times$ distance between punctures. Vertex smooth with

fine punctures, more densely punctated between interocellar area and occipital carina, diameter of puncture $0.4 \times$ to $1.0 \times$ distance between punctures. Postocellar line approximately $0.9 \times$ as long as ocular-ocellar line. Lateral portion of frons convex longitudinally and finely punctated. Protuberance deeply hollowed and bifurcated at upper portion. Antenna with 34/35 flagellomeres; first flagellomere very slightly longer than second; second as long as third. Occipital carina complete.

Mesosoma. Front margin of pronotum smooth, posterior with dense oblique longitudinal rugae. Epomia distinct. Front portion of mesonotum with distinct punctures; median portion strongly coarse, longitudinally rugose. Notaulus deep, reaching centre of mesoscutum. Scutoscuteellar groove densely rugose. Scutellum nearly flat, with even punctures, diameter of puncture $2.0 \times$ to $3.0 \times$ distance between punctures. Postscutellum strongly convex, like a flake curved backward, with a anterior triangular concavity. Mesopleuron with indistinct punctures, rugose anteriorly, median lower portion rugose longitudinally. Speculum distinct. Upper end of epicnemial carina reaching front margin of mesopleuron. Epicnemium weakly coarse. Mesosternum with fine punctures, diameter of puncture $0.2 \times$ to $0.5 \times$ distance between punctures. Metapleuron coarsely sculptured. Wings brownish hyaline. Forewing vein 1cu a distinctly basad 1/M; 3rs m absent; 2rs m very short, $0.15 \times$ to $0.23 \times$ as long as the distance between it to 2m cu. Hind wing veins 1/Cu and cu a equal. Middle tibia slightly twisted, subbasal portion with a oblique longitudinal groove. Carinae of propodeum (Fig. 4) strong; areolated completely. Areola rugose transversely. Petiolar area longitudinally rugose. Lateral and pleural areas irregularly rugose. Propodeal apophysis very compressed, approximately $1.4 \times$ diameter of second antennal flagellomere.

Metasoma. First tergum of metasoma $1.5 \times$ to $1.7 \times$ longer than its apical width, finely rugose irregularly; postpetiole finely rugose transversely between median dorsal carinae; median dorsal carinae distinct, approximately reaching to hind margin of first tergum; spiracle concave. Second to fifth terga finely aciculate. Sixth and seventh terga weakly aciculate on dorsal portions. Seventh and eighth terga (Fig. 5) comparatively elongate. Ovipositor sheath $1.4 \times$ to $1.6 \times$ longer than hind tibia. Apical portion of lower valve of ovipositor (Fig. 6) with 9 ridges, basal 3 ridges oblique, rest vertical; basad of basal ridge with a roughened area.

Coloration. Black. Clypeus and palpi brownish black. Coxae and tarsi of front legs blackish brown, its femora and tibiae brown to fuscous. Middle and hind legs black, except front sides of middle femora sometimes slightly brownish. Bases of all tibiae more or less white. Stigmata darkish brown. Veins brownish black.

♂ Body 8.5–9.5 mm long. Forewing 6.5–6.8 mm long. Antenna with 31–32 flagellomeres. Bases of all tibia, bases of first tarsomeres of front and middle tarsi white.

Cocoon (Fig. 7). Nearly fusiform, 12.5–14.0 mm long, 2.5–3.0 mm wide, about 2.2 mm high. Pale grey.

Holotype ♀, China, Daxinggou, Jilin Province (43.6°N, 129.9°E; alt. 586 m), 2 July 2005, SHENG Mao-Ling leg. **Paratypes:** 1♀, 1♂, same data as holotype except "1–3 July 2005; 1♂, Xinbin, Liaoning Province, alt. 546 m, 10 June 2005, SHENG Mao-Ling leg.; 1♀, 3♂♂, Benxi, Liaoning Province, alt. 418 m, 20 June 2006, SHENG Mao-Ling leg.

Host. Reared from *Monochamus saltuarius* GEBLER (Cerambycidae) in *Larix gmelinii* (Rupr.) Rupr. (Pinaceae) in Daxinggou, Jilin Province.

Host plant. *Larix gmelinii* (Rupr.) Rupr. (Pinaceae).

Etymology. The species name is based on its host's plant.

Diagnosis. The new species is similar morphologically to *I. sanxiaensis* Wang, 1997, but the two species can be distinguished using the following characters. *I. laricinus* has first lateral area of propodeum densely rugose; third to sixth terga finely aciculate; ovipositor sheath $1.4 \times$ to $1.6 \times$ longer than hind tibia; lower valve of ovipositor with roughened area basad ridges. *I. sanxiaensis* has first lateral area of propodeum with distinct punctures; third to sixth terga with dense punctures; ovipositor sheath approximately $1.1 \times$ longer than hind tibia; lower valve of ovipositor without roughened area.

Distribution. China (Jilin and Liaoning).

Key to species of genus *Ischnoceros* known in China

1. Frons with transverse rugae 2
Frons without ruga 3
2. Lateral carinae of propodeal basal area parallel; median portion of base of propodeum descending strongly to form semicircular notch; apical portion of lower valve of ovipositor with roughened area basad basal ridge; hind femora black *I. pedipullus* Sheng
Lateral carinae of propodeal basal area strongly divergent anteriorly; median portion of base of propodeum without deep notch; lower valve of ovipositor without roughened area; hind femora red
..... *I. nisticus* (Geoffroy)
3. Third to sixth terga punctate densely *I. sanxiaensis* Wang
Third to sixth terga finely aciculate 4
4. Lower valve of ovipositor with roughened area basad ridges
..... *I. laricinus* sp. nov.
Lower valve of ovipositor without roughened area 5
5. Median longitudinal carina of first tergum at least reaching to spiracle; second tergum finely aciculate mesally; coxae with large reddish brown flecks; middle femora reddish brown *I. eutetrphae* sp. nov.
Median longitudinal carina of first tergum at most reaching half distance to spiracle; second tergum not aciculate; coxae black; middle femora black
..... *I. sapporensis* Uchida

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寄生钻蛀害虫的瘦角姬蜂属 (膜翅目, 姬蜂科) 二新种及中国已知种检索表

盛茂领

国家林业局森林病虫害防治总站 沈阳 110034

摘要 报道寄生天牛的瘦角姬蜂属 *Ischnoceros* Gravenhorst, 1829 2 新种: 天牛瘦角姬蜂 *I. eutraphae* sp. nov., 寄生直脊天牛 *Eutrapha saleainpunctata* (Motschulsky); 松瘦角姬蜂 *I. laricinus* sp. nov., 寄生云杉花墨天牛 *Monochamus saltuarius* Gebler. 编制了中国已知种检索表。

天牛瘦角姬蜂, 新种 *Ischnoceros eutraphae* sp. nov. (图 1~3)

新种与北海道瘦角姬蜂 *I. sapporensis* Uchida, 1928, 相近, 可通过下列特征区别: 并胸腹节基区与中区由横脊分隔, 侧突高为触角第 2 鞭节直径的 1.5~1.6 倍; 腹部第 2 节背板具横细纹; 翅基片褐色; 中足基节大部分为红褐色; 中足腿节红褐色或主要为红色。北海道瘦角姬蜂: 并胸腹节基区与中区合并, 无横脊分隔, 侧突高约等于触角第 2 鞭节直径; 腹部第 2 节背板具刻点; 翅基片褐黑色; 中足基节和中足腿节黑色。

正模 ♀, 辽宁新宾, 546 m, 2005-08-20, 盛茂领。副模: 1♀, 辽宁新宾, 546 m, 2005-06-09, 盛茂领; 1♂, 吉林伊通, 336 m, 2005-05-17, 盛茂领。

寄主: 直脊天牛 *Eutrapha saleainpunctata* (Motschulsky)。

寄主植物: 紫椴 *Tilia amurensis* Rupr.。

松瘦角姬蜂, 新种 *Ischnoceros laricinus* sp. nov. (图 4~7)

本种与三峡瘦角姬蜂 *I. sanxiensis* Wang, 1997 相近, 可通过下列特征区别: 并胸腹节第 1 侧区具清晰的斜纵皱; 腹部第 3~6 节背板具横细纹; 产卵器鞘长为后足胫节长的 1.4~1.6 倍; 产卵器腹瓣端部, 在脊的内侧具 1 粗糙区。三峡瘦角姬蜂: 并胸腹节第 1 侧区具清晰的刻点; 腹部第 3~6 节背板具稠密的刻点; 产卵器鞘长约为后足胫节长的 1.1 倍; 产卵器腹瓣端部无粗糙区。

正模 ♀, 吉林大兴沟, 586 m, 2005-07-02, 盛茂领。副模: 1♀, 1♂, 吉林大兴沟, 586 m, 2005-07-01~03, 盛茂领; 1♂, 辽宁新宾, 546 m, 2005-06-10, 盛茂领; 1♀, 3♂, 辽宁本溪, 418 m, 2006-06-20, 盛茂领。

寄主: 云杉花墨天牛 *Monochamus saltuarius* Gebler。

寄主植物: 兴安落叶松 *Larix gmdinii* (Rupr.) Rupr.。

瘦角姬蜂属中国已知种检索表

- | | |
|------------------|---|
| 1. 额具稠密的横皱 | 2 |
| 额无皱 | 3 |

2. 并胸腹节基部中央具1半圆形深凹, 基区两侧的纵脊平行; 产卵器腹瓣端部, 在纵脊的内侧具1段粗糙的纵带; 后足腿节黑色
..... 暗足瘦角姬蜂 *I. pedipullus* **Sheng**

并胸腹节基部中央无半圆形凹, 基区两侧的纵脊向前强烈分散; 产卵器腹瓣光滑, 无粗糙的纵带; 后足腿节红色
..... 赤足瘦角姬蜂 *I. rusticus* (**Geoffroy**)

3. 腹部第3~6节背板具稠密的刻点
..... 三峡瘦角姬蜂 *I. sanxiaensis* **Wang**

腹部第3~6节背板具稠密的细横线纹
..... 4
- 4 产卵器腹瓣端部, 在纵脊的内侧具1段粗糙的纵带
..... 松瘦角姬蜂, 新种 *I. laridinus* **sp. nov.**

产卵器腹瓣光滑, 无粗糙的纵带
..... 5

5 腹部第1节背板的中纵脊至少伸抵气门; 第2节背板具清晰的横线纹; 基节具较大的红褐斑; 中足腿节红褐色或主要为红色
..... 天牛瘦角姬蜂, 新种 *I. eutetraphae* **sp. nov.**

腹部第1节背板的中纵脊至多伸达基部至气门的一半; 第2节背板无横线纹; 基节黑色; 中足腿节黑色
.....

..... 北海道瘦角姬蜂 *I. sapporensis* **Uchida**

关键词 膜翅目, 姬蜂科, 瘦角姬蜂属, 新种, 钻蛀害虫, 直脊天牛, 云杉花墨天牛.

中图分类号 Q969. 544. 8